

**Rio Mesa Solar Electric Generating Facility (RMSEGF)
(11-AFC-4)
Applicant's Specific Comments on the Preliminary Staff Assessment**

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SPECIFIC COMMENTS

1. **Page 4.1-2, Fourth Paragraph, Second Sentence:** Lead is not analyzed in the Public Health Section. No lead emissions are expected from the natural gas-fired boilers and/or emergency engines. Applicant requests the following changes:

Toxic lead is not analyzed as a criteria pollutant, but lead and other toxic air pollutant emissions impacts are analyzed in the Public Health section of the PSA.

2. **Page 4.1-3, Air Quality Table 1:** The EPA NSPS Subpart Dc is applicable to boilers with a heat input less than 100 MMBtu/hr rather than less than 30 MMBtu/hr. Applicant requests the following changes:

**Air Quality Table 1
Laws, Ordinances, Regulations, and Standards**

Applicable LORS	Description
Federal	
40 CFR Part 60	<p>New Source Performance Standards (NSPS), Subpart Db Standards of Performance for Electricity Steam Generation Units. Establishes emission standards and monitoring/recordkeeping requirements for units with greater than 100 MMBtu/hr heat input.</p> <p>Subpart Dc Standards of Performance for Electricity Steam Generation Units. Establishes emission standards and monitoring/recordkeeping requirements for units with less than <u>100 MMBtu/hr</u> 30 MMBtu/hr heat input.</p> <p>Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for compressions ignition internal combustion engines, including emergency fire water pump engines.</p>

3. **Page 4.1-12, Second Paragraph, First Two Sentences:** Applicant requests the following changes for clarification purposes:

In accordance with applicable EPA modeling protocols, the pollutant modeling analysis includes was limited to the pollutants listed above in **Air Quality Table 5**. Staff believes there is no adequate model to account for the contribution of a single power plant to the secondary aerosol formation. Besides, the emissions of lead and visibility

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reducing particulates or their precursors would be insignificant from a solar power plant using natural gas boilers.

4. **Page 4.1-16, First Paragraph:** Applicant requests the following changes to make this paragraph consistent with the Air Quality Proposed Conditions of Certification:

These emission estimates appear reasonable in terms of the onsite equipment and offsite vehicle use and the offsite vehicle fugitive dust emissions. However, ~~staff the onsite fugitive dust emissions estimate may be underestimated given the amount of activity on the site and appropriate level of control for the applicant's proposed mitigation measures (specifically watering unpaved roads).~~ Staff recommends additional mitigation measures, specifically the use of CEC-approved soil binders on unpaved roads and other inactive disturbed surfaces during construction, to ensure so that the applicant's fugitive dust emissions estimate and associated impacts comply with the applicable standards would be minimized for this project.

5. **Page 4.1-16, Sub-Bullet Items:** Applicant requests the following changes for clarification purposes:

- One auxiliary boiler (249 MMBtu/hr) would provide steam prior to sunrise to expedite the process of bringing the solar plants online and power augmentation primarily in the late afternoon/early evening. During cloudy periods or in case of an emergency shutdown, this boiler would also assist in preheating the solar generating system to facilitate plant restart. Each auxiliary boiler would have a maximum of no more than 1,100 equivalent full-load hours and 865 startup hours of use per year;
- One night preservation boiler (15 MMBtu/hr) would provide ~~superheated~~ steam to the steam turbine generator (STG) and steam turbine driven the boiler feedwater pump and other systems overnight and during other shutdown periods when steam is not available from the solar receiver steam generator (SRSR). Each nighttime preservation boiler would have maximum 4,780 equivalent full-load hours and 345 startup hours of use per year;

6. **Page 4.1-17, First Bullet Item under "B. Maximum Daily Emissions":** Please make the following change:

- All auxiliary boilers operate 5 equivalent full-load hours and 2.5 hours in startup mode;

7. **Page 4.1-17, First Bullet Item under "C. Maximum Annual Emissions":** Please make the following change:

- All auxiliary boilers operate 1,100 equivalent full-load hours and 865 hours in startup mode;

8. **Page 4.1-18, First Bullet Item:** Please make the following change:

- All nighttime preservation boilers operate 4,780 equivalent full-load hours and 345 hours in startup mode;

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9. **Page 4.1-18, Second Paragraph:** Applicant requests the following changes to make this paragraph consistent with the Air Quality Proposed Conditions of Certification:

Similar to the construction emissions estimate ~~staff, staff believes that the onsite fugitive dust emissions estimate may be underestimated given the amount of activity on the site and appropriate level of control for the applicant's proposed mitigation measures (specifically, watering unpaved roads). Therefore, staff~~ recommends additional mitigation measures (Condition of Certification **AQ-SC7**) requiring the use of CEC-approved soil binders on unpaved roads and other inactive disturbed surfaces during site operation, to ensure so that the applicant's fugitive dust emissions estimate and associated impacts comply with the applicable standards ~~analysis will be minimized for this project.~~

10. **Page 4.1-20, Second Full Paragraph, Second Sentence:** Please make the following change:

First, all project emissions of nonattainment criteria pollutants and their precursors (PM₁₀, NO_x, VOC and SO₂) are considered significant cumulative impacts that must be mitigated.

11. **Page 4.1-23, First Paragraph:** Please make the following change:

To mitigate the impacts due to construction of the facility, ~~the applicant has~~ Staff concurs to use with the following Applicant-proposed mitigation measures:

12. **Page 4.1-23, Bullet List Items B, C, and I:** Applicant requests the following changes to make this paragraph consistent with the proposed Air Quality Conditions of Certification:

- B. Vehicle speeds will be limited to 10 miles per hour within the construction site on unpaved non-stabilized roads.
- C. All construction equipment vehicle tires will be washed or cleaned free of dirt prior to entering offsite paved roadways.
- I. All soil storage piles and disturbed areas that remain inactive for longer than 10 days will be covered or treated with water or appropriate dust suppressant compounds.

13. **Page 4.1-24, First Bullet List Item:** Applicant requests that the following requirement be revised because it is ambiguous and unenforceable as a practical matter:

N. Construction equipment will be maintained in accordance with prudent industry practice. ~~top service shape.~~

14. **Page 4.1-24, First Paragraph, Last Sentence:** Because soil stabilizers must be approved by the CPM, Applicant requests the following change:

Specific recommendations from staff include a more aggressive dust control requirement to use CPM-approved polymer based, or equivalent, soil stabilizers on the site's unpaved roads and inactive disturbed surfaces during construction.

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15. **Page 4.1-25, Air Quality Table 10:** Applicant requests the following change to the 1-hour Federal NO₂ modeling result to make it consistent with the most recent modeling results submitted to the CEC as part of the July 23, 2012 supplemental data response. As noted in the July 23, 2012 supplemental data response, the 1-hour Federal NO₂ modeling results were based on June 29, 2010 EPA guidance¹ which recommends a five-year average of the annual 1-hr NO₂ 98th percentile (modeled impact plus background) modeling results rather than a 3-year rolling average. Applicant requests the following change to this table:

Air Quality Table 10
Project Operation with Mirror Washing Emissions Impacts

Pollutants	Avg. Period	Impacts (µg/m ³)	Background ^a (µg/m ³)	Total Impact ^b (µg/m ³)	Standard (µg/m ³)	Percent of Standard
NO ₂	1-hr	165	92.4	257.4	339	76%
	1-hr federal ^c	-	-	185 <u>171</u>	188	98 <u>91</u> %
	Annual	0.2	17.1	17.3	57	30%
PM ₁₀	24-hr	1.6	133	134.6	50	269%
	Annual	0.5	22	22.5	20	113%
PM _{2.5}	24-hr	0.7	17.8	18.5	35	53%
	Annual	0.05	7.0	7.05	12	59%
CO	1-hr	158	2,645	2,803	23,000	12%
	8-hr ^d	15.0	778	793	10,000	8%
SO ₂	1-hr	2.4	136.6	139	196	71%
	24-hr ^d	1	18.4	19.4	105	18%
	Annual	0.01	0.0	0.01	80	0%

Source: supplemental information submitted in URS 2012e and BS 2012v,

Notes:

^a Background values have been adjusted per staff recommended background concentrations shown in **Air Quality Table 5**.

^b Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

^c Staff calculates the total impact for the federal 1-hour NO₂ standard based on maximum three-year rolling average of 98th percentile of annual distribution of daily maximum paired sum of project impact and concurrent background for each year (2006-2008). As allowed by a June 29, 2010 EPA guidance document, the Applicant used five-year (2006-2010) average instead and the resulting in a total impact of ~~would be lower~~ (171 µg/m³).

^d Maximum 8-hour CO and 24-hour SO₂ concentrations occur under fumigation conditions.

16. **Page 4.1-26, Third Full Paragraph, Second Sentence:** Please make the following change:

However, due to the limited agricultural activity in the area the project site area would likely be characterized as ammonia poor, and the Rio Mesa SEGF project is not a notable source of ammonia emissions so the small amount of operating NO_x and SO_x emissions ~~that would be~~ generated by this project would have a low ~~reduced~~ potential to create secondary particulate.

17. **Page 4.1-27, Second Full Paragraph:** Because the actual level of flue gas recirculation that will be used by the boilers is not known at this time, Applicant requests the following changes to this paragraph:

The applicant's proposed mitigation for the auxiliary/startup boilers includes Low-NO_x burners and ~~20-percent~~ flue gas recirculation (for NO_x), good combustion practices (for

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CO), and to operate them exclusively on pipeline quality natural gas (for VOC, PM and SOx) to limit boiler emission levels. The AFC (BS 2011a), and ~~PDOC Authority to Construct (ATC)~~ conditions (MDAQMD 2012) provides the following emission limits, for each of the (249 MMBtu/hour HHV) boilers:

18. **Page 4.1-27, First Bullet List, Third Item:** Applicant requests the following change for clarification purposes:

- VOC as CH₄: 12.6 ppmvd at 3% O₂, 1.32 lb/hour

19. **Page 4.1-27, Third Full Paragraph:** Because the actual level of flue gas recirculation that will be used by the boilers is not known at this time, Applicant requests the following changes to this paragraph:

The applicant's proposed mitigation for each preservation boiler includes Low-NOx burners and ~~20 percent~~ flue gas recirculation (for NOx), good combustion practices (for CO), and to operate them exclusively on pipeline quality natural gas (for VOC, PM and SOx) to limit boiler emission levels. The supplemental analysis from the applicant (BS 2012v), and ~~final PDOC~~ conditions (MDAQMD 2012) ~~will be included in the Final Staff Assessment and these are expected to require the~~ provides the following emission limits, for each of the smaller (15 MMBtu/hour HHV) boilers:

20. **Page 4.1-27, Second Bullet List, Third Item:** Applicant requests the following change for clarification purposes:

- VOC as CH₄: 12.6 ppmvd at 3% O₂, 0.08 lb/hour

21. **Page 4.1-28, First Bullet List:** Applicant requests that the term "break" be changed to "brake" in the following list:

- NOx: 4.8 grams per ~~break~~ brake horsepower-hour (including non-methane hydrocarbons - NMHC/VOC)
- CO: 2.6 grams per ~~break~~ brake horsepower-hour
- VOC: 0.1669 grams per ~~break~~ brake horsepower-hour
- PM10: 0.15 grams per ~~break~~ brake horsepower-hour
- SO₂: 15 ppm sulfur content diesel fuel

22. **Page 4.1-28, Second Bullet List:** Please revise the term "break" to "brake" in the following list:

- NOx: 3.0 grams per ~~break~~ brake horsepower-hour (including non-methane hydrocarbons - NMHC/VOC)
- CO: 2.6 grams per ~~break~~ brake horsepower-hour
- VOC: 0.1669 grams per ~~break~~ brake horsepower-hour
- PM10: 0.15 grams per ~~break~~ brake horsepower-hour
- SO₂: 15 ppm sulfur content diesel fuel

23. **Page 4.1-28, Third Bullet List:** Applicant requests that the term "break" be changed to "brake" in the following list:

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- NO_x: 3.0 grams per ~~break~~ brake horsepower-hour (including NMHC/VOC)
- CO: 2.6 grams per ~~break~~ brake horsepower-hour
- VOC: (see NO_x above)
- PM₁₀: 0.15 grams per ~~break~~ brake horsepower-hour
- SO₂: 15 ppm sulfur content diesel fuel

24. **Page 4.1-28, Second to Last Paragraph:** Applicant requests this change to clarify that a combination of new on-road and certified off-road vehicles is proposed for mirror washing and maintenance activities:

The applicant has ~~not~~ proposed to use new on-road or certified off-road vehicles and engines any specific emission controls for mirror washing and other maintenance activities to minimize emissions for this emission source.

25. **Page 4.1-28, Last Paragraph:** Applicant requests the following change to clarify that privately owned vehicles are not under the control of Applicant:

The applicant has no control over privately owned vehicles and therefore has not proposed any specific emission controls for this emission source.

26. **Page 4.1-29, Bullet List Items 1, 2, and 3:** Applicant requests the following changes to make this list consistent with AQ-SC6 and AQ-SC7 as revised below:

- ~~Require the use of new model year vehicles at the time of purchase for onsite maintenance, or equivalently low emitting vehicles as long as those vehicles can be demonstrated to have a similar or lower emission profile than new model year vehicles (AQ-SC6);~~
- Limit vehicle speeds within the facility to no more than ten miles per hour on unpaved areas that have not undergone soil stabilization, and up to 25 miles per hour, or greater with CPM approval, on stabilized unpaved roads as long as no visible dust plumes are observed, to address fugitive PM emissions from the site (AQ-SC7);
- Apply and maintain water or a non-toxic soil binder¹ to the onsite unpaved roads to create a durable, stabilized surface (AQ-SC7);

27. **Page 4.1-29, Second to Last Paragraph:** Applicant requests the following change to this paragraph to make it consistent with AQ-SC9 as revised below:

Staff also proposes Condition of Certification **AQ-SC8** to ensure that the license is amended as necessary to incorporate changes to the air quality permits and ~~AQ-SC9 to require use of engines that meet model year EPA/ARB Tier emission standards for the year purchased.~~

28. **Page 4.1-35, Air Quality Table 11:** As discussed above in Comment Number 16, Applicant requests the following change to the 1-hour Federal NO₂ modeling result to make it consistent

¹ The soil stabilizer product used will require prior approval by the CPM Energy Commission.

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with the most recent modeling results submitted to the CEC as part of the July 23, 2012 supplemental data response. As noted in the July 23, 2012 supplemental data response, the 1-hour Federal NO₂ modeling results were based on June 29, 2010 EPA guidance which recommends a five-year average of the annual 1-hr NO₂ 98th percentile (modeled impact plus background) modeling results rather than a 3-year rolling average. Applicant requests the following change to this table:

Air Quality Table 11
Ambient Air Quality Impacts from Cumulative Sources (µg/m³)

Pollutants	Avg. Period	Impacts (µg/m ³)	Background ^a (µg/m ³)	Total Impact (µg/m ³)	Standard (µg/m ³)	Percent of Standard
NO ₂	1-hr	165	92.4	257.4	339	76%
	1-hr federal ^b	-	-	185 <u>171</u>	188	98 <u>91</u> %

Source: supplemental information submitted on July 23, 2012 (BS 2012v)

Notes:

^a Background values have been adjusted per staff recommended background concentrations shown in **Air Quality Table 5**.

^b ~~Staff calculates the total impact for the federal 1-hour NO₂ standard based on maximum three-year rolling average of 98th percentile of annual distribution of daily maximum paired sum of project impact and concurrent background for each year (2006-2008). As allowed by a June 29, 2010 EPA guidance document, the Applicant used a five-year (2006-2010) average instead and the resulting in a total impact would be lower of 171 µg/m³.~~

29. **Page 4.1-36, Fifth Paragraph, Second Sentence:** Applicant requests the following changes to make it clear that the Project does not trigger MDAQMD Best Available Control Technology requirements:

The emitting equipment will be well controlled; however, Best Available Control Technology would be implemented requirements are not triggered, and emission reduction credits (ERCs) are not required to offset the proposed project's emissions by District rules and regulations based on the permitted stationary source emission levels for the proposed project.

30. **Page 4.1-38, Fourth Paragraph, Last Sentence:** Applicant requests the following change for clarification purposes:

Compliance with this rule is assured with the required use of pipeline quality natural gas (annual average sulfur content equal to or less than 0.25 grains/100 dscf) and ultra-low sulfur diesel fuel for the emergency engines.

31. **Page 4.1-41, Last Bullet List Item:** Applicant requests the following change to this list to make consistent with Applicant's requested removal of AQ-SC9.

- ~~• Condition of Certification **AQ-SC9** is needed to ensure that the emergency engines meet applicable model year emission standards.~~

32. **Page 4.1-70, Second to Last Paragraph, Second Sentence:** Please make the following change:

The primary sources that would cause GHG emissions would be from daily operation of each boiler (five hours per day of operation plus additional hours for startup of each ~~for~~ auxiliary boiler and twelve to sixteen hours per day of operation plus an hour for startup of each ~~for~~ nighttime boiler), power block maintenance activities, including mirror

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cleaning and minimal undesired vegetation removal, weekly testing of the emergency generator and firewater pump, and employee commute trips.

33. **Page 4.1-71, First Paragraph, Last Two Sentences:** For purposes of determining whether the Project meets the U.S. EPA's Prevention of Significant Deterioration ("PSD") thresholds, mirror washing emissions are from a mobile source and thus are not considered part of the Project's operational emissions. However, for purposes of evaluating the project's emissions under CEQA, staff should clarify that they considered both the inclusion and exclusion of mirror washing emissions as part of operational emissions. Please make the following change to provide this clarification:

~~Staff was not able to determine the degree to which mirror washing should be included in the documentation of o~~ Operating emissions ~~so operating emissions~~ are shown both with and without mirror washing activities. GHG emissions from mobile equipment may not count towards operating emissions.

34. **Page 4.1-71, Greenhouse Gas Table 3:** Applicant requests the following change to the total annual electrical production to make it consistent with the information in the revised Project Description (Table 2.1-1) submitted as part of the July 23, 2012 supplemental data response submitted to the CEC:

Greenhouse Gas Table 3
Rio Mesa SEGF, Estimated Potential Greenhouse Gas (GHG) Emissions

Emitting Source	Maximum Emissions, metric tonnes/yr				
	CO ₂	CH ₄	N ₂ O	SF ₆	CO ₂ -equivalent (MTCO ₂ E ^a per year)
Auxiliary Boilers	31,900	0.60	0.06	--	
Nighttime Preservation Boilers	7,672	0.14	0.01	--	
Power Block Emergency Generators	704	0.03	0.01	--	
Common Area Emergency Generator	40	1.6E-03	3.3E-04	--	
Power Block Fire Pump Engines	48	2.0E-03	3.9E-04	--	
Common Area Fire Pump Engine	24	9.8E-04	2.0E-04	--	
WSACs	0	0	0	--	
Employee and Delivery Vehicles	4,824	0.2	3.9E-02	--	
Equipment Leakage (SF ₆)	--	--	--	1.5E-03	
Total	45,212	0.98	1.2E-01	1.5E-03	
Global warming potential multiplier	1x	21x	310x	23,900x	
Total Project GHG Emissions – MTCO₂E^b	45,212	20.48	37.32	36.52	45,307
Mirror washing activities FFT ^c (on-road vehicles)	18,093	15	46	--	18,153
Mirror washing activities NT ^d (off-road vehicles)	1,292	1	3	--	1,297
MTCO₂	64,597	MTCO₂E^b			64,757
Facility MWh per year ^e	1,374,000 1,424,600				1,374,000 1,424,600

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Facility CO ₂ EPS (MTCO ₂ /MWh)	0.045 ^f	Facility GHG Performance (MTCO ₂ E/MWh)	0.045 ^f
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Sources: BS 2012v and email from Sierra Research

Notes:

^a One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

^b Annualized basis uses the project owner's assumed maximum permitted operating basis.

^c Far from Tower (FFT)

^d Near Tower (NT)

^e Estimated Gross MWh

^f Value includes mirror washing

35. **Page 4.1-72, First Paragraph, Last Two Sentences:** Applicant requests the following changes to this paragraph to make it consistent with the revised annual electrical production level shown above in Greenhouse Gas Table 3:

The CO₂ emissions result from a project capacity factor of ~~31~~ 33 percent, well below the trigger for the SB1368 Emission Performance Standard of 60 percent capacity factor. Regardless, the new Rio Mesa SEGF facility would emit at 0.047⁵ MTCO₂/MWh (with mirror washing), which would easily meet the SB1368 Greenhouse Gas Emission Performance Standard of 0.5 MTCO₂/MWh, if it applied.

36. **Page 4.1-74, Second to Last Paragraph:** Please make the following change:

Finally, while the Rio Mesa SEGF combusts some natural gas in onsite boilers for the purposes of improving plant efficiency by facilitating the startup of the solar boiler system ~~freeze protection~~ and to initiate and sustain output during periods of low solar irradiance, the latter displaces higher-emission generation, and reduces the need for energy and ancillary services from natural gas-fired resources, potentially obviating the need for their construction/operation.

37. **Page 4.1-76, Third Paragraph, First Sentence:** Applicant requests the following changes to this paragraph to make it consistent with the revised greenhouse gas MTCO₂E/MWh emission levels shown above in Greenhouse Gas Table 3:

While the Rio Mesa SEGF would combust natural gas and thus emit GHGs as part of its operations, it would produce far less GHG emissions (emitting about ~~104~~ 100 lbs CO₂/MWh) than the coal- and natural gas-fired resources it would displace.

38. **Page 4.1-78, First Paragraph:** Please make the following change:

The Rio Mesa SEGF will produce GHG emissions during operations, combusting natural gas in order to provide assistance in starting the solar boiler ~~freeze protection~~ and increase or sustain energy output during periods of reduced solar irradiance (early morning and late afternoon hours, periods of high cloud cover).

39. **Page 4.1-78, Second Paragraph, First Sentence:** Please make the following change:

The ability to produce energy for both station service and transmission to end-users slightly earlier and slightly later than would otherwise be the case without limited supplemental firing, as well as to smooth out fluctuations in output during periods when

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solar irradiance is interrupted has not only economic value to the owner, but provides reliability to the electricity system.